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PELAGIC OSTRACODS COLLECTED ON HUDSON 70 BETWEEN THE EQUATOR AND 55°S IN THE ATLANTIC

By Georgiana B. Deevey
Florida State Museum, University of Florida, Gainesville, Florida 32611

Zooplankton samples were collected in the South Atlantic on the first two legs of the CSS HUDSON 70 Expedition. Between the equator and 55°S, samples were obtained routinely along the 30°W Longitude parallel (Fig. 1). The first leg of the expedition left Halifax in mid-November 1969 and arrived at Rio de Janeiro in mid-December. The second leg left Rio on December 20th, proceeded down the 30°W Longitude parallel to 55°S, then passed northeast of South Georgia and up the 40°W Longitude parallel to 47°S, crossed the Argentine Basin to the Rio Plata and arrived in Buenos Aires in mid-January, 1970. Between the equator and 25°S, zooplankton samples were collected for the micropaleontology program by vertical tows, 200–0 m, with a ½ meter net of No. 8 mesh. South of 27°30′S, hauls were made with ¾ m nets of No. 6 mesh to varying depths with up to 4,000 m of cable out, and the 200–0 m vertical tows were also obtained.

Some 70 species of pelagic ostracods were recorded, of which two belong to the family Cypridinidae and the rest to the family Halocyprididae. Since many species of ostracods are bathypelagic, only 33 species were found in the 200–0 m tows collected between the equator and 25°S. Eight species (*Conchoecia acuminata, C. allotherium, C. atlantica, C. concentrica, C. echinata, C. inermis, C. incisa* and *C. stigmatica*) were not noted south of 16°S. Six more species (*C. ctenophora, C. echinulata, C. microprocera, C. macrocheira, C. parthenoda*

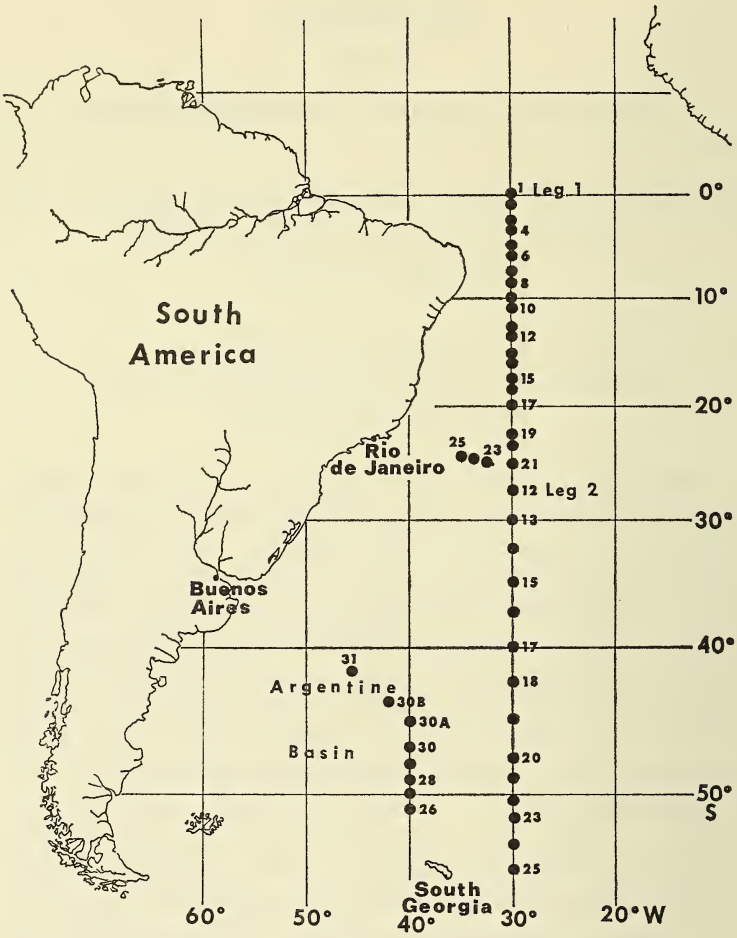

FIG. 1. Map of zooplankton station locations for Legs 1 and 2 of HUDSON 70.

and *C. pseudoparthenoda*) did not occur south of 30°S. Between 30°S and 40°S, 42 species were recorded, half of which were not noted south of the subtropical convergence. Between the subtropical and subantartic convergences, around 42°S–49°S, 27 species were present in the samples, although 9 of these were not found south of 45°S. South of the subantarctic convergence 18 species occurred between 50°S and 55°S. Two

TABLE 1. Station data, Leg 1, Halifax to Rio de Janeiro. 200–0 m vertical tows.

Station	Date	Latitude	Longitude	Time of day	No. species
1	XI/30/69	0°02′N	29°58.3′W	10.40 AM	12
2	XI/30	0°51′S	30°W	9.00 PM	21
3	XII/1	2°29′S	30°W	10.20 AM	18
4	XII/1	3°32′S	30°07′W	10.00 PM	16
5	XII/2	4°55′S	30°W	10.20 AM	16
6	XII/2	6°04′S	30°W	10.15 PM	18
7	XII/3	7°27′S	30°03′W	10.20 AM	14
8	XII/3	8°30.8′S	30°W	10.20 PM	14
9	XII/4	9°59′S	30°W	10.30 AM	11
10	XII/4	10°59′S	29°59′W	10.00 PM	16
11	XII/5	12°26′S	30°07′W	10.00 AM	10
12	XII/5	13°29′S	30°W	10.30 PM	16
13	XII/6	14°55′S	30°07′W	10.30 AM	7
14	XII/6	15°47′S	29°59′W	10.15 PM	13
15	XII/7	17°32′S	30°W	1.30 PM	8
16	XII/7	18°19.5′S	30°04′W	10.50 PM	11
17	XII/8	20°S	30°W	8.15 AM	10
18	XII/8	20°02.6′S	30°31.3′W	Midnight	17
19	XII/9	22°30.2′S	29°58′W	2.15 PM	9
20	XII/9	23°21′S	29°55′W	9.45 PM	19
21	XII/10	25°S	30°W	8.30 AM	14
22	XII/10	24°52.5′S	30°08′W	8.15 PM	15
23	XII/11	24°37′S	32°30.6′W	8.15 AM	12
24	XII/11	24°17.3′S	32°44′W	9.00 PM	16
25	XII/12	24°13.4′S	35°W	7.15 AM	15

species, *C. isocheira* and *C. belgicae*, were found only south of the subantarctic convergence. The total number of species recorded therefore decreased markedly between the subtropical and subantarctic convergences. HUDSON 70 specimens extend the southward ranges in the Atlantic for 27 species, some by only a few degrees. The northward range was extended for two species, *C. belgicae* and *C. major* (= *C. plactolycos major*). *C. plactolycos* (= *C. plactolycos plactolycos*), described from the Indian Ocean, is now known from the Atlantic. A few species, such as *C. elegans* and *C. skogsbergi*, increased in size farther south. Larger forms began

TABLE 2. Station data, Leg 2, Rio de Janeiro to Buenos Aires.

Station	Date	Latitude	Longitude	Total M of cable	No. species
12	XII/23/69	27°31.6′S	30°07′W	450	18
13	XII/24	30°00′S	29°59′W	1400	32
14	XII/25	30°25.05′S	30°10.5′W	1500	30
15	XII/26	35°00′S	30°04.7′W	1800	36
16	XII/27	37°28′S	29°59.2′W	2500	30
17	XII/28	39°55′S	29°53′W	2500	30
18	XII/29	42°30′S	29°57.5′W	2500	24
19	XII/30	45°07.3′S	29°59′W	2500	15
20	XII/31	47°35′S	29°53.4′W	2500	9
21	I/1/70	49°03.4′S	29°48.7′W	2500	14
22	I/2	50°33.3′S	29°35.4′W	2500	12
23	I/3	52°04′S	30°04′W	2500	7
24	I/4	53°27′S	29°59.5′W	2500	6
25	I/5	54°55′S	29°23′W	2500	11
26	I/8	51°28′S	39°57′W	3000	14
27	I/8	49°59′S	39°58′W	1000	9
28	I/9	48°59′S	39°52.4′W	500	6
29	I/10	47°59′S	39°59.6′W	400	7
30	I/10	47°03′S	40°04.6′W	3000	13
30A	I/11	45°10.6′S	41°10.8′W	4000	16
30B	I/12	44°12.4′S	42°46′W	4000	25
31	I/13	41°46.5′S	46°26.4′W	2500	31

to appear in the region of the subtropical convergence, but the increase in size was gradual; two distinct size ranges for a species were not noted.

The station data for Legs 1 and 2 are given in Tables 1 and 2. Table 2 shows the decrease in numbers of species/station south of the subtropical convergence, and the increase in numbers of species as the ship proceeded north over the Argentine Basin. Table 3 lists the species of ostracods, together with the stations from which they were recorded and their overall latitudinal distribution. All specimens have been deposited in the Florida State Museum.

I am indebted to Gordon Riley, Director of the Institute of Oceanography at Dalhousie University, for arranging for my travel between Halifax and South America, to C. R. Mann

TABLE 3. The species of ostracods, their station records and latitudinal distribution.

Species	Stations	Latitudinal distribution
Gigantocypris mülleri	Leg 2: 16, 18, 19, 22, 24, 30A	37°28′S–53°27′S
Macrocypridina castanea	Leg 2: 13, 15	30°S–35°S
Fellia cornuta dispar	Leg 2: 13–19, 30B	30°S–45°S
Halocypria globosa	Leg 1: 18, 20–25; Leg 2: 12–16, 18, 30A, 31	20°S–45°S
Halocypris brevirostris	Leg 1: 2–25; Leg 2: 12–19, 21, 31	0°–49°S
Archiconchoecia cucullata	Leg 2: 13–17, 22, 30B	30°S–50°33′S
A. striata	Leg 1: 2–4, 6–8, 10–25; Leg 2: 12–16, 31	0°–41°45′S
Conchoecia acuminata	Leg 1: 3–6	2°26′S–6°S
C. acuticosta	Leg 2: 14–19, 30B, 31	32°25′S–45°S
C. aequiseta	Leg 2: 13–16, 31	30°S–42°S
C. allotherium	Leg 1: 2–14	0°′51′S–15°42′S
C. amblypostha	Leg 2: 13–17, 30, 31	30°S–47°S
C. ametra	Leg 2: 13–17, 30B, 31	30°S–44°S
C. atlantica	Leg 1: 2, 3, 5–7	0°51′S–7°27′S
C. belgicae	Leg 2: 25, 26	51°28′S–55°S
C. bispinosa	Leg 1: 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 25; Leg 2: 12–17, 31	0°–42°S
C. borealis antipoda	Leg 2: 15, 17–28, 30–31	35°S–55°S
C. brachyaskos	Leg 2: 16–18, 21–23, 25–27, 30A–31	37°28′S–55°S
C. chuni	Leg 2: 14–22, 25, 27–31	32°25′S–55°S
C. concentrica	Leg 1: 2	0°51′S
C. ctenophora	Leg 2: 13	30°S
C. curta	Leg 1: 1–12, 14, 16–18, 20, 21, 23–25; Leg 2: 12–15	0°–35°S

TABLE 3. Continued.

Species	Stations	Latitudinal distribution
C. daphnoides	Leg 1: 5, 20; Leg 2: 12–17, 31	5°S–42°S
C. dichotoma	Leg 2: 18	42°30′S
C. echinata	Leg 1: 1–6, 10, 18	0°–20°S
C. echinulata	Leg 1: 10, 14, 20, 22, 24, 25; Leg 2: 12, 13	11°S–30°S
C. edentata	Leg 1: 20; Leg 2: 17, 18, 25	23°19′S–55°S
C. elegans	Leg 1: 1–9, 15, 17, 20–25; Leg 2: 13–23, 25–31	0°–55°S
C. gaussae	Leg 2: 14, 26	32°25′S–51°28′S
C. glandulosa	Leg 2: 30B	44°S
C. haddoni	Leg 2: 15–19, 21, 26, 30–31	35°S–51°28′S
C. hettacra	Leg 2: 21–30B	49°S–55°S
C. hirsuta	Leg 2: 15, 30B, 31	35°S–44°S
C. hyalophyllum	Leg 1: 6; Leg 2: 12–18, 31	6°S–42°30′S
C. imbricata	Leg 1: 16, 24; Leg 2: 12–17	18°S–40°S
C. incisa	Leg 1: 4	3°40′S
C. inermis	Leg 1: 12	13°30′S
C. isocheira	Leg 2: 21, 22, 24–26	49°S–55°S
C. kyrtophora	Leg 2: 17	40°S
C. lophura	Leg 2: 13–17, 19, 30B, 31	30°S–45°S
C. loricata loricata	Leg 2: 15	35°S
C. macrocheira	Leg 1: 2; Leg 2: 12	0°–27°32′S
C. macromma	Leg 2: 30B	44°S
C. magna	Leg 1: 1–14, 16–18, 20–25; Leg 2: 12–18, 31	0°–42°S
C. major (= *C. plactolycos major*)	Leg 2: 21, 23–26, 30, 30B	44°S–55°S

TABLE 3. Continued.

Species	Stations	Latitudinal distribution
C. mamillata	Leg 2: 13–16, 30B, 31	30°S–44°S
C. microprocera	Leg 1: 2, 3, 9, 10, 12, 15, 17, 18, 20–25	0°–25°S
C. nasotuberculata	Leg 1: 2–4, 6, 8, 10, 14, 24; Leg 2: 13, 14, 17, 18, 31	0°–42°30′S
C. oblonga	Leg 1: 1–14, 16–25; Leg 2: 12–16, 31	0°–42°S
C. obtusata antarctica	Leg 2: 7–22, 26–31	40°S–51°28′S
C. parthenoda	Leg 1: 1–3, 9–15, 17, 19–25; Leg 2: 12, 13	0°–30°S
C. parvidentata	Leg 2: 15–20, 29–31	35°S–48°S
C. plactolycos	Leg 2: 30B, 31	42°S–44°S
C. plinthina	Leg 2: 18	42°30′S
C. porrecta	Leg 1: 1–6, 8, 10–25; Leg 2: 12, 13, 15, 16	0°–37°28′S
C. procera	Leg 1: 1–14, 16, 18–25; Leg 2: 12–15, 17	0°–40°S
C. pseudoparthenoda	Leg : 1–3, 5–7, 10; Leg 2: 12, 13	0°–30°S
C. rotundata	Leg 1: 2–9, 12, 15, 17–25; Leg 2: 12–15	0°–35°S
C. secernenda	Leg 1: 8, 12; Leg 2: 12	8°31′S–27°30′S
C. serrulata	Leg 2: 17–22, 26–31	40°S–51°30′S
C. skogsbergi	Leg 2: 13–27, 30–31	30°S–55°S
C. spinifera	Leg 1: 2, 12, 18, 20, 22; Leg 2: 13–17, 31	0°–42°S
C. spinirostris	Leg 1: 1–25; Leg 2: 12–17, 31	0°–42°S
C. stigmatica	Leg 1: 1, 3, 5, 7–9	0°–10°S
C. subarcuata	Leg 1: 8, 10, 12, 14, 18, 25; Leg 2: 13–16	8°31′S–37°28′S
C. symmetrica	Leg 2: 15–23, 25–27, 30–31	35°S–55°S
C. teretivalvata	Leg 1: 5; Leg 2: 13–21, 29–31	5°S–49°S
C. valdivae	Leg 2: 14, 15, 17, 18, 30A–31	32°25′S–45°S

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THE SPECIES OF OSTRACODS

Suborder CYPRIDINIFORMES Skogsberg

Family Cypridinidae Dana

Gigantocypris muelleri Skogsberg. One gravid female, 19.9 mm long, and 7 juvenile specimens were taken in hauls with 2,500 m of cable out, between 37°30′S and 53°30′S.

Distribution: 63°38′N–62°S in the Atlantic.

Macrocypridina castanea (Brady) s. str. One female 5.9 mm long and a female 6.2 mm long were found at 30°S and 35°S. Poulsen (1962) designated the Indo-Pacific form as *M. castanea rotunda.*

Distribution: 56°N–35°S in the Atlantic.

Suborder HALOCYPRIFORMES Skogsberg

Family Halocyprididae Dana

Subfamily Archiconchoecinae Poulsen

Archiconchoecia cucullata (Brady). A number of specimens were taken in tows with 750–4000 m of cable out, between 30°S and 50°30′S.

Distribution: 52°N–50°30′S in the Atlantic; Indian Ocean. These specimens extend the southward range.

A. striata Müller. This tiny species was common in the 200–0 m hauls taken between the equator and 25°S and was present to 37°30′S, 30°W and at about 42°S in the Argentine Basin; it did not occur south of the subtropical convergence.

Distribution: 36°N–42°S in Atlantic; Indian and Pacific Oceans and Mediterranean. These specimens extend the southward range.

Subfamily Halocyprinae Poulsen

Halocypria globosa Claus. *H. globosa* occurred from 20°S–42°S, 30°W, and in the Argentine Basin between 42°S and 45°S. Females were caught at shallow depths, but males (Fig. 2h) were taken only in samples collected with 750–2500 m of cable out.

Distribution: 64°N–37°S in the Atlantic; Pacific and Indian Oceans. These specimens extend the range south to 45°S.

Halocypris brevirostris (Dana). This species was present in all 200–0 m tows obtained between the equator and 25°S, and was found down to 49°S, extending the southward range in the Atlantic. Between the

equator and 32°30′S, adult specimens were 1.15–1.25 mm long. Females up to 1.45 mm long appeared at 35°S; between 37°30′S and 42°30′S females were 1.5–1.6 mm long.

Distribution: 60°N–49°S in the Atlantic; Pacific and Indian Oceans.

Fellia cornuta dispar (Müller). Müller (1906a) described two subspecies of *F. cornuta*, the typical form, *F. cornuta typica* (1906a) = *F. cornuta cornuta* (1912), which has a sharp horn on each side of the shoulder vaults (Fig. 2a), and *F. cornuta dispar* for some southern hemisphere males which lacked these projections and had rounded shoulder vaults. Both Müller and Poulsen (1969a) recorded only males as lacking the sharp horns. Müller's specimens were found south of 29°S in the Atlantic and Indian Oceans, and Poulsen's south of 30°S in the Pacific off New Zealand. The typical horned form has been recorded from around 20°N–38°S in the Atlantic, around the equator in the Indian Ocean and Indo-Pacific regions, and from around 30°N–45°S in the Pacific. Both males and females, lacking the sharp lateral processes, were found between 30°S and 45°S, in hauls with 1100–2500 m of cable out; no typical forms were taken. Juvenile specimens 1.30–1.45 mm long (Fig. 2f) had small lateral points on the shoulder vaults, not as large and curved as in the typical form (Fig. 2a). Specimens 2.0–2.1 mm long had either no points or very tiny points (Fig. 2g). Mature males 2.9–3.1 mm long (Fig. 2d, e) and females 3.00–3.35 mm long (Fig. 2b, c) had completely rounded shoulder vaults. This subspecies can therefore be distinguished from the typical form in the juvenile stages.

Distribution: 29°S–45°S in the Atlantic; south of 29°S in Pacific and Indian Oceans.

Subfamily Conchoecinae Poulsen

Most Halocyprids belong to the genus *Conchoecia*, for which over 90 species have been described. Müller's (1906a) system of grouping species together into more or less natural groups of related forms will be followed here.

Spinifera Group Müller

C. spinifera Müller. This species was recorded from the equator to 40°S, 30°W and at about 42°S in the Argentine Basin, extending the recorded southward range. It did not occur south of the subtropical convergence.

Distribution: 52°N–42°S in the Atlantic; Indian and Pacific Oceans.

C. oblonga (Claus). Müller (1906a) distinguished two forms of this species, Form A in which the right asymmetrical gland opens at the postero-ventral corner, and Form B in which the gland opens just anterior to this location. In the Canary Island region Angel (1969) found Form A at shallower depths than Form B. The two forms were not distinguished in the HUDSON 70 material. *C. oblonga* was found from the equator to 37°S and at about 42°S in the Argentine Basin, extending its southward range.

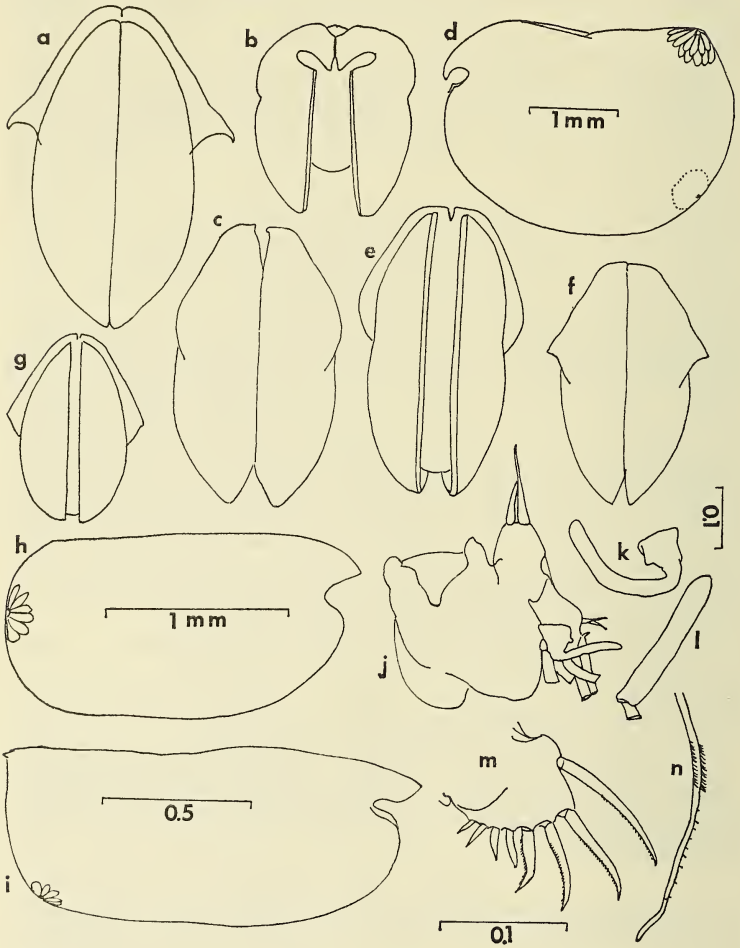

Fig. 2. a, Ventral view of female *Fellia cornuta cornuta* from the Caribbean Sea; b and c, Anterior and dorsal views of female *F. cornuta dispar*; d and e, Lateral and ventral views of male *F. cornuta dispar*; f, Dorsal view of 1.3 mm juvenile; g, Ventral view of 2.0 mm juvenile; h, Lateral view of *Halocypria globosa* male; i, Lateral view of *Conchoecia allotherium* male; j, Endopodite of left second antenna of *C. allotherium* male; k, Right clasper; l, Capitulum of frontal organ; m, Furca; n, Distal part of proximal secondary seta of male first antenna. Scale on b for a–e and g, on h for f and h, on i for i, on right margin for l and m, at bottom for j, k, and n. Scales in mm.

Distribution: 48°N–42°S in Atlantic; Indian and Pacific Oceans.

C. allotherium Müller. Males of this species were taken in two of the 200–0 m tows from 0°51′S and 15°42′S. This species is similar in size and shape to *C. oblonga* Form A (Fig. 2i); also the 4th claw on the furca is curved as in *C. oblonga* (Fig. 2m), and Müller was unable to differentiate the females of the two species. The male is distinguished by a double row of spinules near the tip of the proximal secondary seta (Fig. 2n) of the first antenna, and the frontal organ is bare of spinules (Fig. 2l).

Distribution: 18°N–35°S in Atlantic; 10°N–10°S in Indian Ocean.

C. aequiseta Müller and *C. hirsuta* Müller. Females of these two species are indistinguishable, and males are differentiated only on the basis of long hairs on the distal bristle of the first endopodite joint of the second antenna in *C. hirsuta.* This bristle is bare in *C. aequiseta* males and in females and juveniles of both species. Females and juveniles identified as *C. aequiseta* were found between 30°S and 37°30′S, 30°W; a *C. aequiseta* male was taken at 42°S in the Argentine Basin. *C. hirsuta* males were present in samples from 35°S, 30°W and from 42°S–44°S in the Argentine Basin, so both forms occur south to the region of the subtropical convergence.

Distribution: For *C. aequiseta* 32°N–31°S and for *C. hirsuta* 29°N–35°S in the Atlantic; Indian Ocean. The HUDSON 70 males extend the southward range to 42°S and 44°S, respectively.

C. echinata Müller. This species occurred from the equator to 20°S.

Distribution: 37°N–29°S in Atlantic; Pacific and Indian Oceans.

C. inermis Müller. A single specimen was taken at 13°30′S in a 200–0 m night haul, extending slightly the known southward range.

Distribution: 43°N–13°30′S in Atlantic; Indian Ocean.

C. mamillata Müller. This species was taken in hauls with 1100–4000 m of cable out from 30°S–37°30′S, 30°W, and from 42°S–44°S in the Argentine Basin.

Distribution: 48°N–56°S in the Atlantic; Indian and Pacific Oceans.

Elegans Group Müller

C. elegans Sars. This was one of the commonest species, and occurred from the equator to 55°S. Between the equator and 25°S, males and females were 1.2–1.3 mm long; between 30°S and 40°S larger specimens up to 1.60–1.65 mm long were found; south of 45°S females were 1.5–1.8 mm long and males 1.75–1.85 mm in length.

Distribution: 80°N–55°S in Atlantic; Indian and Pacific Oceans.

Procera Group Müller

C. microprocera Angel. *C. microprocera* was taken at 14 stations between the equator and 25°S in the 200–0 m vertical tows.

Distribution: 32°N–25°S in Atlantic.

C. procera Müller. This species occurred from the equator to 40°S and was not found south of the subtropical convergence.

Distribution: 32°N–40°S in the Atlantic; Mediterranean and Indian Ocean.

C. brachyaskos Müller. *C. brachyaskos* was recorded from 37°30′S to 55°S, 30°W and from 42°S–45°S in the Argentine Basin, from hauls with 1000–4000 m of cable out. Females (Fig. 3a) were 1.5–1.6 mm and males (Fig. 3b) 1.4–1.5 mm long. Although larger than the specimens recorded from the Sargasso Sea (Deevey, 1968), the frontal organs (Fig. 3c, d) and male claspers (Fig. 3f, g) were similar. Also the armature (Fig. 3e) of the male first antenna had no more teeth or spinules than that of the smaller males.

Distribution: 32°N–56°30′S in the Atlantic; Indian and Pacific Oceans.

Acuminata Group Müller

C. acuminata (Claus). This species was taken in only 4 of the 200–0 m tows collected between 2°26′S and 6°S.

Distribution: 46°N–37°S in the Atlantic; Pacific and Indian Oceans.

Obtusata Group Müller

C. obtusata Sars var. *antarctica* Müller. *C. obtusata* is a bipolar species. *C. obtusata antarctica* was found from 40°S to 50°30′S, 30°W and from 42°S to 51°30′S in the Argentine Basin, in hauls with 100–200 m of cable out, as well as the deeper tows. The length range for males (Fig. 3j) was 1.25–1.35 mm and for females (Fig. 3i) 1.65–1.85 mm. The antarctic form differs from the arctic form primarily in the shape of the frontal organs (Fig. 3n, o) and the right male clasper (Fig. 3m) and usually in the shape of the posterior end of the shell. The capitulum of the frontal organs of both males and females is sharply pointed, and the right male clasper is bent at a more acute angle than in the arctic forms. The armature of the principal seta of the male first antenna (Fig. 3p) is apparently similar.

Distribution: 23°S–68°S in Atlantic; 26°S–68°S in the Pacific. *C. obtusata obtusata* occurs chiefly north of 60°N in the Atlantic and Arctic Ocean and at 58°N in the Skager Rak and Cattegat.

Rotundata Group Müller

This group is greatly in need of taxonomic revision. Müller originally included 7 species in this group, which differs from all others in the position of the asymmetrical glands: *C. macromma, C. pusilla major, C. pusilla minor, C. glandulosa, C. kyrtophora, C. nasotuberculata, C. rotundata* and *C. isocheira. C. rotundata* has since been separated into 3 species (Iles, 1953): *C. rotundata, C. skogsbergi* Iles and *C. teretivalvata* Iles, and Rudyakov (1962) has described *C. abyssalis* from the Pacific. Eleven species were found in the HUDSON 70 samples, in-

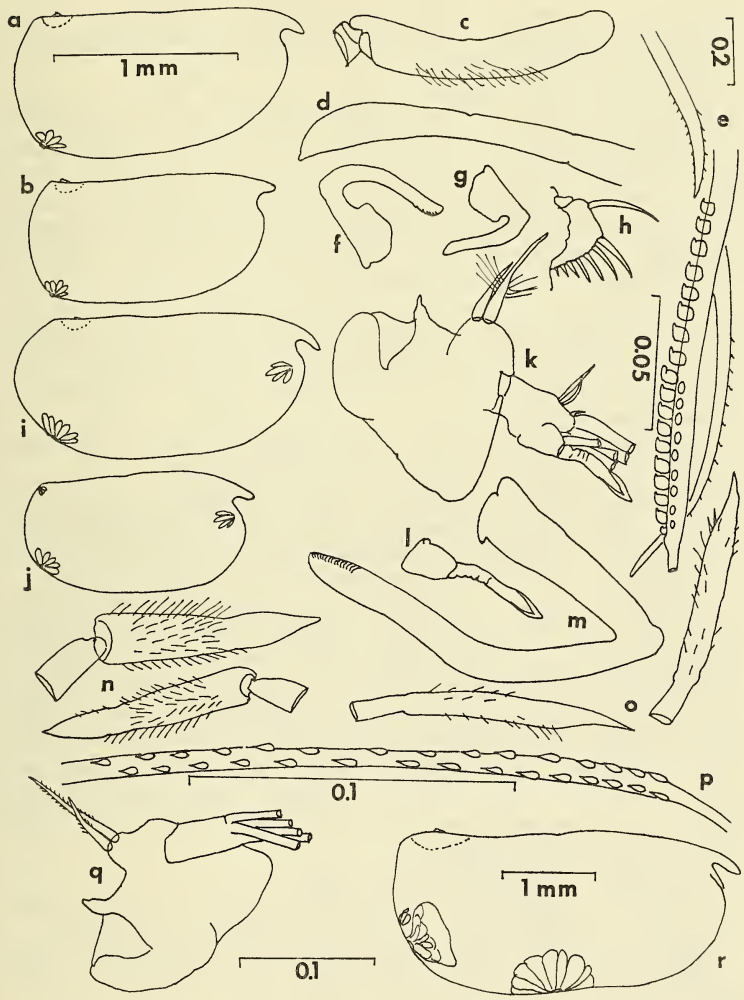

Fig. 3. a and b, Lateral views of female and male *Conchoecia brachyaskos*; c and d, Capitulum of frontal organs of male and female; e, Armature of male first antenna; f and g, Right and left male claspers; h, Female furca; i and j, Lateral views of female and male *C. obtusata antarctica*; k, Endopodite of male left second antenna; l and m, Left and right male claspers; n, Capitulum of frontal organs of two males; o, Capitulum of frontal organs of two females; p, Armature of principal seta of male first antenna; q, Endopodite of female second antenna; r, Lateral view of female *C. gaussae*. Scale on a for a, b, i and j, at upper right for h, beside e for e, below p for p, at bottom center for c, d, f, g, k–o and q, on r for r. Scales in mm.

cluding two new forms, which, due to insufficient material, will not be described in this report. Of the known species, only *C. abyssalis* and *C. pusilla* were not recorded.

C. teretivalvata Iles (Figure 4). This species was recorded from 5°S in the 200–0 m tows and from 30°S–49°S, 30°W and from 42°S–48°S in the Argentine Basin. As in the case of *C. skogsbergi*, smaller and larger forms were present, and the larger forms may eventually prove to be a different species, but males of both sizes had the large penis (Fig. 4l) shaped as figured by Müller (1894, Pl. 6, Fig. 20). Females and males, 0.85–0.90 mm long (Fig. 4b, g, h), occurred down to 42°30′S and at 42°S in the Argentine Basin. Larger specimens 1.0–1.1 mm long (Fig. 4a, j) were found from 40°S–49°S, between the subtropical and subantarctic convergences. Smaller males had 9–10 pairs of teeth on the principal seta of the first antenna, and larger males 10–11 pairs of teeth (Fig. 4e). Larger and smaller males had claspers of similar shape (Fig. 4c, d, i).

Distribution: Mediterranean; warmer Atlantic to 29°S in Benguela Current. These specimens extend the range southward.

C. rotundata Müller. This species, as described from the Sargasso Sea (Deevey, 1968), occurred from the equator to 35°S. The length range for females was 0.87–0.95 mm and for males 0.80–0.85 mm (Fig. 5h).

Distribution: 32°N–35°S in Atlantic; tropical Pacific.

C. skogsbergi Iles. *C. skogsbergi* was recorded from 30°S–55°S, 30°W and from 42°S–47°S in the Argentine Basin, from all stations where samples were collected with 1000 or more meters of cable out. Smaller specimens, females 1.10–1.25 mm long and males 1.05–1.20 mm long, such as those described from the Sargasso Sea (Deevey, 1968) were found from 30°S–35°S where larger specimens 1.35–1.50 mm long were also present. South of 35°S females were 1.4–1.7 mm long and males 1.35–1.75 mm long (Fig. 5b). Males 1.7 mm long had 14 pairs of teeth on the principal seta of the first antenna, whereas males 1.25 mm long had 13 pairs of teeth.

Distribution: 32°N–65°S in the Atlantic.

C. nasotuberculata Müller. This species (Fig. 5a) was found from the equator to 42°30′S, just south of the subtropical convergence.

Distribution: 18°N–40°S; Indian Ocean and Mediterranean. These specimens extend the range slightly south.

C. kyrtophora Müller. This is not the species described (Deevey, 1968) as *C. kyrtophora* from the Sargasso Sea. One female 0.93 mm long (Fig. 5g) and one male 0.95 mm long were collected at 40°S in a haul with 2500 m of cable out. This species is closely related to *C. nasotuberculata*, but the female is distinguished by lacking the lateral bumps on the shell that are characteristic of female *C. nasotuberculata*.

Distribution: 14°N–35°S in Atlantic; Indian Ocean. These specimens extend the range 5° south.

C. macromma Müller. Two females 1.40 (Fig. 5c, d) and 1.27 mm long and one male 1.50 mm long were collected at 44°12.4′S, 42°46′W

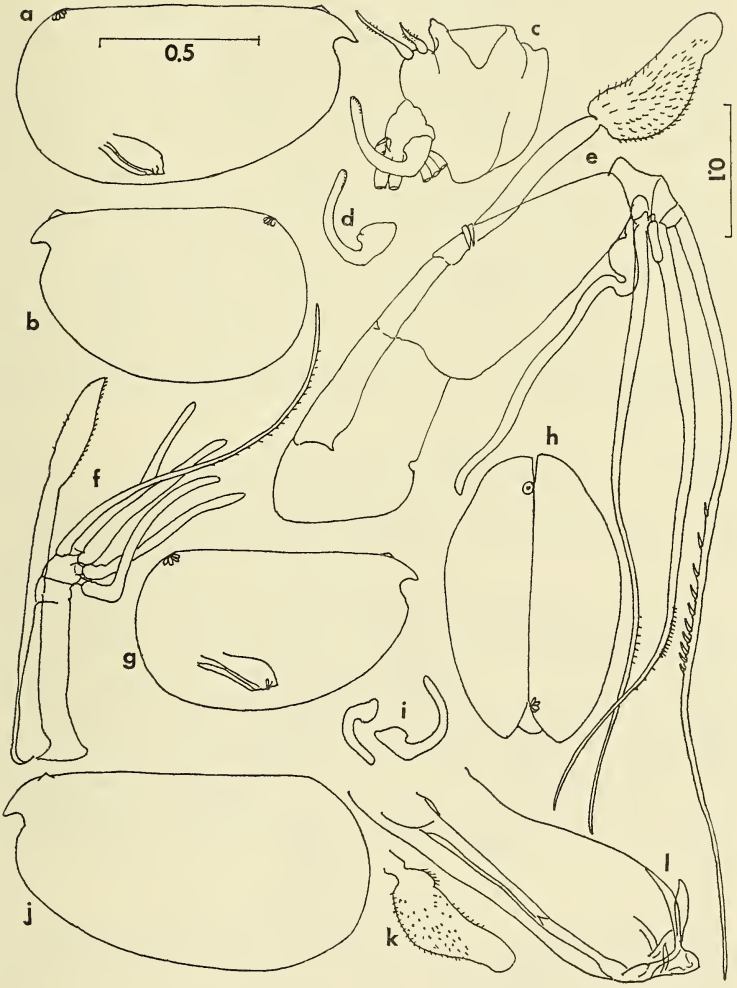

Fig. 4. *Conchoecia teretivalvata.* a, A 1.10 mm male; b, 0.92 mm female; c, Endopodite of right second antenna of 1.07 mm male; d, Right clasper of 1.05 mm male; e, Frontal organ and first antenna of 1.05 mm male; f, Frontal organ and first antenna of 0.92 mm female; g and h, Lateral and dorsal views of 0.85 mm male; i, Left and right claspers of 0.9 mm male; j, 1.1 mm female; k, Capitulum of frontal organ of 0.9 mm male; l, Penis of 1.0 mm male. Scale on a for a, b, g, h and j, at upper right for c–f, i, k and l. Scales in mm.

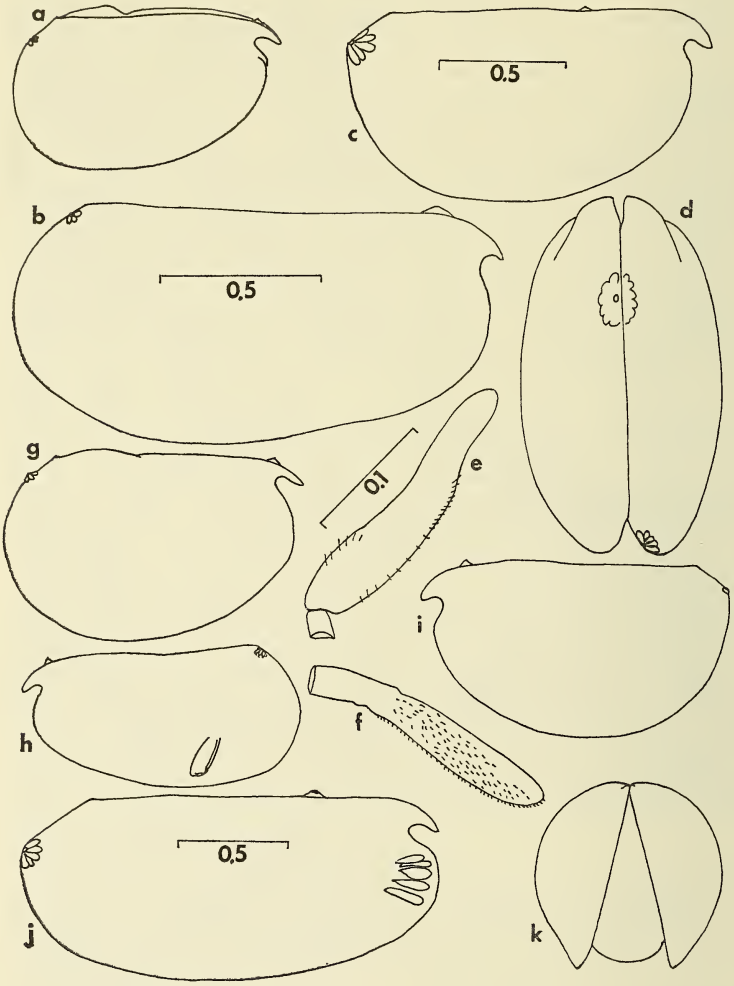

Fig. 5. a, Lateral view of 0.85 mm female *Conchoecia nasotuberculata*; b, 1.6 mm male *C. skogsbergi*; c and d, Lateral and dorsal views of 1.4 mm female *C. macromma*; e and f, Capitulum of frontal organs of male and female *C. macromma*; g, Lateral view of 0.93 mm female *C. kyrtophora;* h, 0.85 mm male *C. rotundata*; i, 0.93 mm female *C. isocheira*; j and k, Lateral and posterior views of 1.95 mm female *C. glandulosa*. Scale on b for a, b, g–i, on c for c and d, in center for e and f, on j for j and k. Scales in mm.

in a haul with 4000 m of cable out. Although these specimens are larger than those described by Müller from 24°N–3°S in the Atlantic, the position of the asymmetrical glands, the frontal organs (Fig. 5e, f), and the structure of the first and second antennae agree with his figures. Iles (1953) listed one female from a 750–1000 m haul at 25°S in the Benguela Current, but did not give its size or any corroboratory data.

Distribution: 24°N–25°S in the Atlantic; Indian Ocean. These specimens extend the range to 44°S.

C. glandulosa Müller. One female 1.95 mm long (Fig. 5j, k) was caught at 44°S in the Argentine Basin in a haul with 4000 m of cable out.

Distribution: 32°N–64°S in the Atlantic; Pacific and Indian Oceans.

C. isocheira Müller. *C. isocheira* (Fig. 5i) occurred from 49°S–55°S, in hauls with a minimum of 500 m of cable out. The length range for females was 0.95–1.05 mm and for males 0.84–1.00 mm.

Distribution: 53°S–71°S in the Atlantic, Indian and Pacific Antarctic. The HUDSON 70 specimens extend the range a few degrees to the north.

Curta Group Müller

C. curta Lubbock. This species was found from the equator to 35°S, and did not occur south of the subtropical convergence.

Distribution: 48°N–37°S in the Atlantic; Indian and Pacific Oceans and Mediteranean.

C. echinulata (Claus). *C. echinulata* was present from 11°S–30°S.

Distribution: 34°N–37°S in Atlantic; Indian Ocean.

C. stigmatica Müller. Juvenile specimens of this species were noted from the equator to 10°S in the 200–0 m tows.

Distribution: 0°39′N–31°S in Atlantic; Indian and Pacific Oceans.

C. acuticosta Müller. This species occurred from 32°30′S–45°S, 30°W and from 42°S–44°S in the Argentine Basin, primarily in hauls with 1000–4000 m of cable out.

Distribution: 27°N–36°S in the Atlantic; Indian and Pacific Oceans. These specimens extend the range to 45°S.

Bispinosa Group Müller

C. haddoni Brady and Norman. *C. haddoni* was present from 35°S to 51°30′S, 30°W, and from 42°S–47°S in the Argentine Basin, in hauls with 1000–4000 m of cable out. The length range noted for females was 2.8–3.1 mm and for males 2.30–2.55 mm. Müller noted that the southern forms were larger than those from the North Atlantic, where Angel (1970) recorded length ranges of 2.15–2.53 mm for females and 1.75–2.00 mm for males.

Distribution: 60°N–51°30′S in Atlantic; Indian Ocean.

C. bispinosa Claus. *C. bispinosa* was found from the equator to 40°S, 30°W and at 42°S in the Argentine Basin. Ramirez and Moguilevsky (1971) identified all their specimens, collected between 36° and 38°S, as *C. secernenda*, but their smaller males around 2.1 mm long were

evidently *C. bispinosa*, since they noted 29 pairs of teeth on the principal seta of the male first antenna. Apparently, as in the case of *C. haddoni*, specimens of *C. bispinosa* are larger in the South Atlantic than in the North. HUDSON 70 females were 1.85–2.20 mm long and males 1.90–2.00 mm long. Angel (1970) recorded length ranges of 1.8–2.1 mm for females and 1.65–1.88 mm for males from around 29°N–33°N in the eastern North Atlantic. Females from the Sargasso Sea were 1.80–1.95 mm long and males 1.65–1.80 mm long (Deevey, 1968).

Distribution: 43°N–42°S in the Atlantic.

C. secernenda Vavra. This species was caught only in several 200–0 m tows between 8°30′S and 27°30′S, 30°W, and apparently is not as abundant in the South Atlantic as in the North. Judging by their large size (females 2.6 mm and males 2.3 mm mean length) Poulsen's (1969b) specimens identified as *C. bispinosa* from the Gulf of Guinea are presumably *C. secernenda*; he did not state the number of teeth on the principal seta of the male first antenna, but believes *C. secernenda* and *C. bispinosa* to be synonymous.

Distribution: 37°N–38°S in the Atlantic.

C. atlantica (Lubbock). *C. atlantica* was found only between 0°51′S and 7°27′S, 30°W.

Distribution: 40°N–37°S in the Atlantic; Indian and Pacific Oceans.

Gaussae Group Skogsberg

Skogsberg (1920) included *C. gaussae* and *C. incisa* in this group, both of which Müller (1906a) had put in the *Bispinosa* Group. In this report *C. edentata*, which Müller assigned to the *Acuminata* Group, is also included. These three species differ from all others in having large compound glands on the mid-ventral margin of both shells, as well as the usual asymmetrical glands. Poulsen (1969b) has provisionally included *C. congolensis* Poulsen in this group, although it lacks the glands on the ventral margin.

C. edentata Müller. Three females, 1.65, 1.73, 1.73 mm long, and two juvenile specimens 1.40 and 1.45 mm long were collected between 23°S and 55°S. Müller described this species from a 1.7 mm male and an immature female. Barney (1921) recorded 4 specimens from a 0–1000 m haul at about 72°S in the Pacific Antarctic, and Iles (1953) a single female from a 250–500 m tow at 23°S in the Benguela Current. Rudyakov (1962) gave a supplementary description of a 1.83 mm female and 2 males, 1.43–1.45 mm long.

Distribution: 0°39′N–56°S in the Atlantic; 55°S–62°S in the Indian Ocean; 72°S and 44°N–50°N in the Pacific.

C. incisa Müller. A single female, 2.37 mm long, was caught in a 200–0 m tow at 3°40′S, 30°W. Müller (1906a) described this species from a 2.15 mm male and a 2.5 mm female from the Indian Ocean. Poulsen (1969b) has since recorded 3 females, 2.5–2.6 mm long, from a station near the equator in the Gulf of Guinea. Angel (1969) noted this species from the Canary Island region.

Distribution: 29°N–3°40′S in the Atlantic; 2°S–26°S in the Indian Ocean.

C. gaussae Müller. One female, 3.45 mm long, was caught at 32°30′S in a haul with 750 m of cable out, and another female, 3.85 mm long (Fig. 3r), was taken at 51°30′S in a tow with 3000 m of cable out. Müller (1908) described the species from a single male, 3.1 mm long, from 35°11′S, 2°43′E. Skogsberg (1920) described the female from a 3.6 mm specimen from 50°S in the Atlantic. A subspecies, *C. gaussae curilensis*, has been described from the Kuril Kamchatka region from two females 4.08–4.18 mm long (Rudyakov, 1962). The only other recorded specimens are two 4.0 mm females and a 3.3 mm male from 2°S–6°35′S in the Gulf of Guinea (Poulsen, 1969b).

Distribution: 2°S–51°30′S in the Atlantic; 46°31′N, 154°22′E in the Pacific

Loricata Group Müller

C. loricata loricata (Claus). A single male, 1.8 mm long, was found at 35°S in a haul with 1800 m of cable out.

Distribution: 46°N–37°S in the Atlantic; Indian Ocean and Mediterranean.

C. ctenophora Müller. One female, 2.7 mm long, was taken at 30°S in a haul with 1400 m of cable out.

Distribution: 18°N–35°S in the Atlantic; near equator in Indian and Pacific Oceans.

Serrulata Group Skogsberg

C. concentrica Müller. A single female, 1.55 mm long, was found at 0°51′S.

Distribution: 38°N–3°S in the Atlantic; Malay Archipelago and Indian Ocean.

C. serrulata Claus. This species occurred from 40°S–51°30′S, in hauls with 100 or more meters of cable out. It was most numerous between 47°S and 49°S, over the convergence in subantarctic waters in the Argentine Basin. The length range for females was 1.40–1.65 mm and for males 1.25–1.35 mm.

Distribution: 10°S–58°S in the Atlantic; to 59°S in the Indian Ocean and to 68°S in the Pacific.

Magna Group Müller

C. magna Claus. *C. magna* occurred from the equator to 42°30′S, and was present in almost all 200–0 m tows. Females had a length range of 1.7–2.0 mm and males of 1.6–1.9 mm.

Distribution: 52°N–55°S in the Atlantic; Indian and Pacific Oceans and Mediterranean.

C. lophura Müller. This species, easily recognized by the large group of gland cells on the ventral margin at the postero-ventral corner of the

shell, was found from 30°S–45°S, in hauls with 750–2500 m of cable out.

Distribution: 46°N–48°S in the Atlantic; Pacific and Indian Oceans and Mediterranean.

C. parvidentata Müller. *C. parvidentata* occurred from 35°S–48°S, to the region of the subantarctic convergence. Females had a length range of 2.55–2.85 mm and males of 2.15–2.50 mm.

Distribution: 31°N–48°S in Atlantic; Indian Ocean.

C. hyalophyllum Claus. This species was recorded from 6°S in a 200–0 m tow and from 27°30′S–42°30′S. Females were 1.65–1.80 mm long and males 1.55–1.70 mm long.

Distribution: 52°N–48°S in the Atlantic; Indian Ocean.

C. macrocheira Müller. *C. macrocheira* was noted on only two occasions, at 0°51′S and at 27°30′S, in hauls with 200–450 m of cable out.

Distribution: 60°N–34°S in the Atlantic; Indian and Pacific Oceans.

C. subarcuata Claus. This species was recorded from 8°31′S–37°30′S, and did not occur south of the subtropical convergence.

Distribution: 59°N–56°S in the Atlantic; Indian and Pacific Oceans.

C. parthenoda Müller. *C. parthenoda* was found from the equator to 30°S. The two specimens described as *C. parthenoda* by Ramirez and Moguilevsky (1971, p. 657, Pls. 12–13) may represent *C. magna*; at least in the case of the male the size is too great and the left asymmetrical gland is not placed far enough forward on the dorsal margin.

Distribution: 37°N–30°S in the Atlantic; Indian and Pacific Oceans.

C. pseudoparthenoda Angel. This species occurred from the equator to 30°S in 200–0 m tows. The male specimen figured as *C. parthenoda* from Barbados (Deevey, 1970) is now recognized as *C. pseudoparthenoda.* Also, in all probability Poulsen's (1969b) description and figures of his male *C. parthenoda* represent *C. pseudoparthenoda.*

Distribution: 14°N–30°S in the Atlantic.

C. spinirostris Claus. *C. spinirostris* was recorded from the equator to 40°S, 30°W and to 42°S in the Argentine Basin, and was not found south of the subtropical convergence.

Distribution: 45°N–24°S in the Atlantic; Pacific and Mediterranean. These specimens extend the range to 42°S.

C. porrecta Claus. This species was found from the equator to 37°30′S, and also did not occur south of the subtropical convergence. Because of their size, the specimens identified by Poulsen (1969b) as *C. spinirostris* must be *C. porrecta*; Poulsen does not separate these two species.

Distribution: 41°N–2°N in the Atlantic; Mediterranean. These specimens extend the range to 37°30′S.

Mollis Group Müller

C. amblypostha Müller (Figure 6). This species occurred from 30°S–40°S, 30°W and from 42°S–47°S in the Argentine Basin, in hauls with 1100–3000 m of cable out. Poulsen (1969b) recorded this species from 1°S–17°S in the Gulf of Guinea, from 670–800 m depths. Müller (1906a)

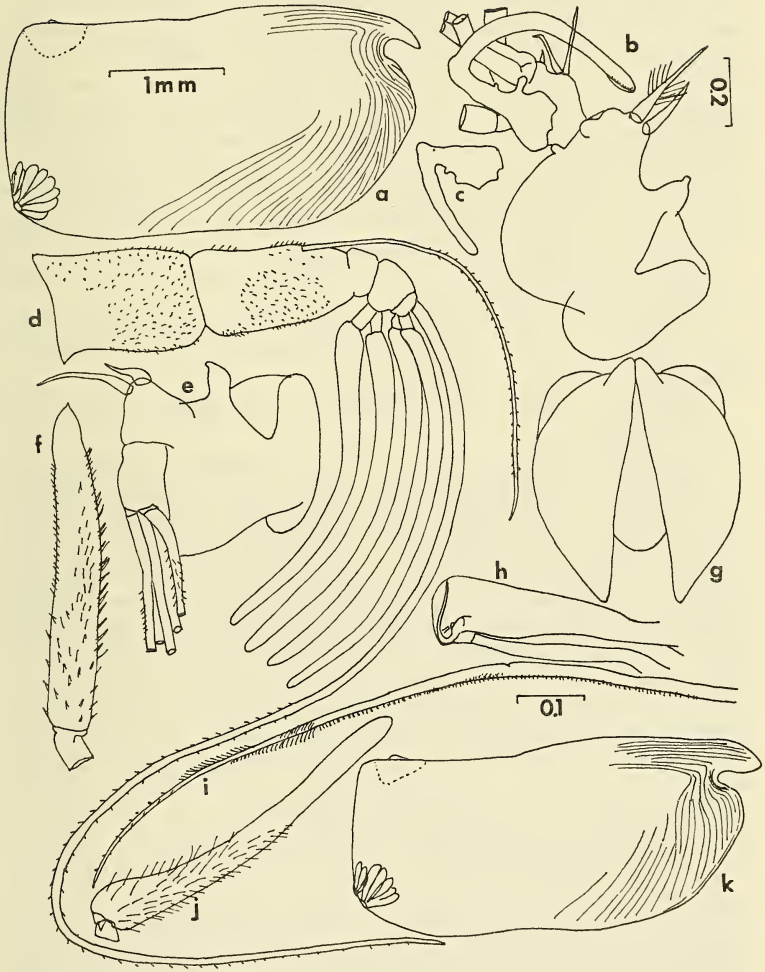

FIG. 6. *Conchoecia amblypostha.* a, Lateral view of female; b, Endopodite of male right second antenna; c, Left clasper; d, Female first antenna; e, Endopodite of female second antenna; f, Capitulum of female frontal organ; g, Posterior view of female; h, Male penis; i, Armature of distal secondary seta of male first antenna; j, Capitulum of male frontal organ; k, Lateral view of male. Scale on a for a, g, k, below i for b–f, i, j, at upper right for h. Scales in mm.

was unable to differentiate the females (Fig. 6a, g) from those of *C. mollis*, but males are distinguished by the armature of the first antenna, particularly the distal secondary seta (Fig. 6i) and the shape of the penis (Fig. 6h). No *C. mollis* males were noted. Females had a length range of 3.30–3.75 mm and males of 3.2–3.5 mm. The female frontal organ (Fig. 6f), first and second antennae (Fig. 6d, e) are indeed similar in structure and spination to those of female *C. mollis*. The male claspers (Fig. 6b, c) are also similar in the two species, but the male *C. mollis* lacks the long hairs on the "b" bristle of the endopodite of the second antenna that are present in male *C. amblypostha*.

Distribution: 1°S–37°31′S in the Atlantic; Indian Ocean. These specimens extend the range to 47°S.

C. dichotoma Müller. A single immature female, 2.04 mm long, was taken at 42°30′S in a haul with 2500 m of cable out. Poulsen (1969b) recorded 3 specimens from 0°50′S.

Distribution: 0°50′S–35°S in the Atlantic. This specimen extends the range to 42°30′S.

C. plactolycos Müller (Figure 7). Müller described two subspecies of *C. plactolycos*: *C. plactolycos typica* (1906a) = *C. plactolycos plactolycos* (1912) and *C. plactolycos major* (1906a, 1908). Specimens of both of these forms were collected in the HUDSON 70 samples and are easily distinguishable, so that each form should be raised to the rank of species. According to rule, *C. plactolycos plactolycos* thus becomes *C. plactolycos* Müller and *C. plactolycos major* is named *C. major* Müller. Müller described *C. plactolycos* from a single male 2.3 mm long from 29°S in the Indian Ocean. One male, 2.5 mm long, was taken at 44°12.4′S, 42°46′W in a haul with 4000 m of cable out. This specimen (Fig. 7c, d, g–k) agrees with Müller's description in the shape of the shell, location of the glands, shape of the frontal organ and clasping organs and the armature of the first antenna (Müller, 1906a, p. 114, Pl. 25, Figs. 14–20). *C. plactolycos* is closely similar to *C. major*, but is smaller in size and the sculpturing of the shell is difficult to discern. The principal seta of the male first antenna has 33 pairs of short fat teeth (Fig. 7i) as against 43 pairs for the *C. major* male (Fig. 8i) and the distal secondary seta is not armed (Fig. 7d) as in the larger form. The medial glands on the posterior margin are much more visible in the *C. plactolycos* male (Fig. 7k). A single female, 2.7 mm long (Fig. 7a, b), taken at 41°44.6′S, 46°33′W, resembles the male in shape and sculpturing. The female differs from that of *C. major* in having fewer spinules on the basal segments of the first antenna (Figs. 7f and 8d) and in lacking spinules on the anterior side of the principal seta. Unfortunately, the distal part of the capitulum of the frontal organ was broken off (Fig. 7e).

Distribution: 42°S–44°S in the Atlantic; 29°S in the Indian Ocean.

C. major (= *C. plactolycos major*) Müller (Figure 8). *C. major* was recorded from 49°S–55°S, 30°W and from 44°S–47°S in the Argentine

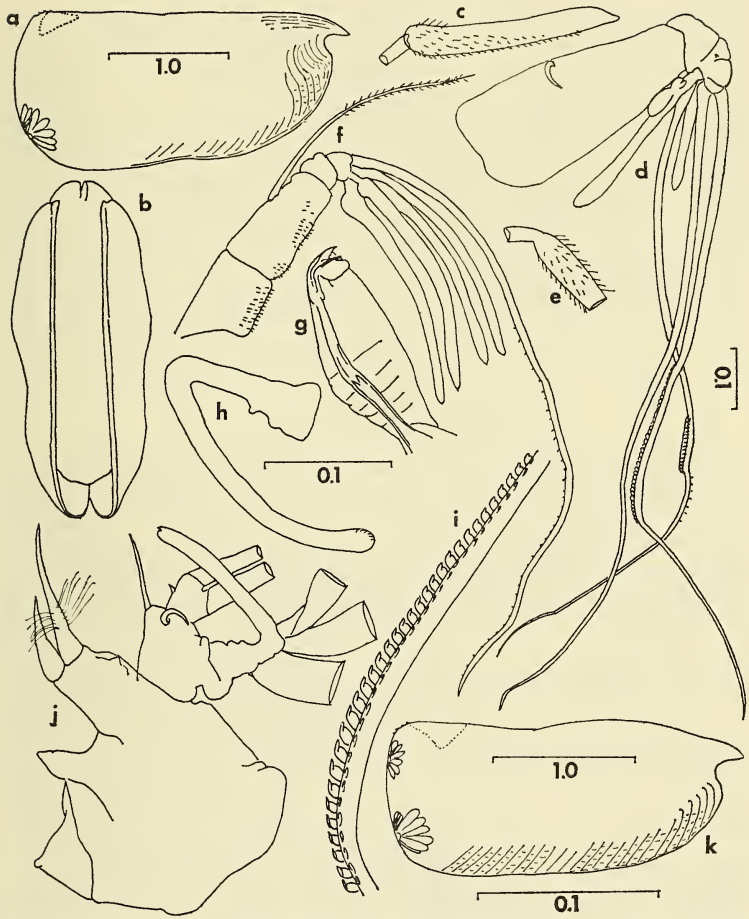

FIG. 7. *Conchoecia plactolycos* (= *C. plactolycos plactolycos*). a and b, Lateral and ventral view of female; c, Capitulum of male frontal organ; d, Male first antenna; e, Proximal part of capitulum of female frontal organ; f, Female first antenna; g, Male penis; h, Male right clasper; i, Armature of principal seta of male first antenna; j, Endopodite of male left second antenna; k, lateral view of male. Scale on a for a and b, on k for k, in center for j and h, at bottom right for i, on right margin for c–g. Scales in mm.

Basin in hauls with 2500–4000 m of cable out. The length range for females was 3.1–3.6 mm and for males 2.97–3.30 mm. Apparently this is the first record of this species since Müller (1906a, 1908) described it from 56°S in the Atlantic and 62°S–65°S in the Indian Ocean. The

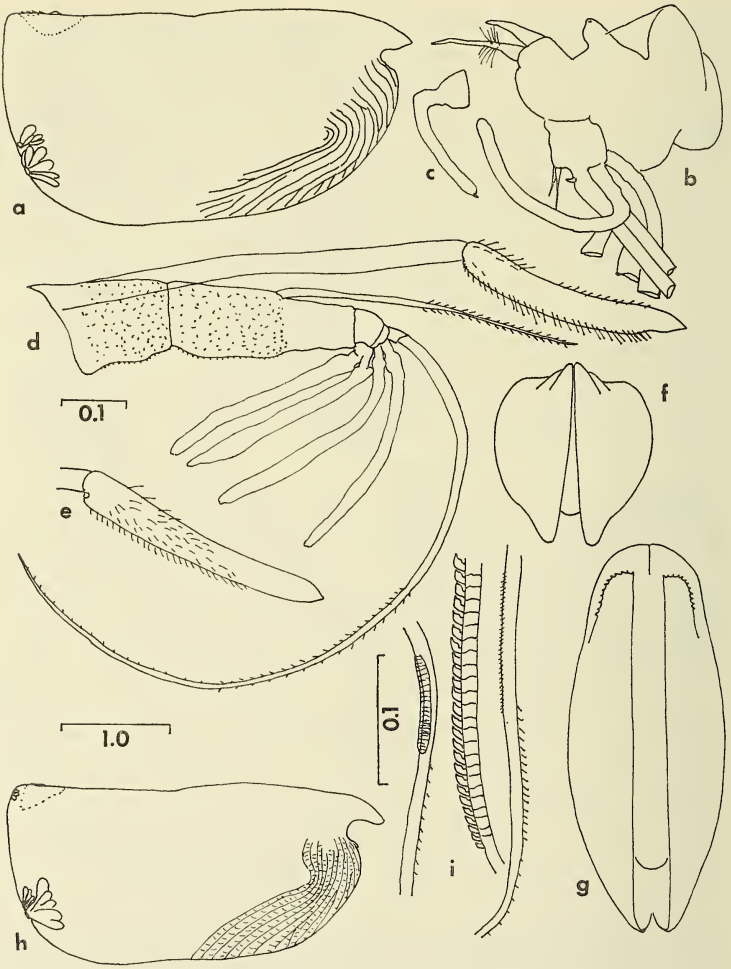

Fig. 8. *Conchoecia major* (= *C. plactolycos major*). a, Lateral view of female; b, Endopodite of male right second antenna; c, Male left clasper; d, Frontal organ and first antenna of female; e, Capitulum of male frontal organ; f, g and h, Posterior, ventral and lateral views of male; i, Armature of male first antenna. Scale above h for a, f–h, beside i for i, at left center for b–e. Scales in mm.

sculpturing on the shell (indicated in Fig. 8a, h) is much more definite than in *C. plactolycos*; other differences have been noted above.

Distribution: 56°S in Atlantic; Indian Ocean. These specimens extend the range north to 44°S.

C. borealis Sars var. *antipoda* Müller. *C. borealis antipoda* occurred from 35°S–55°S, 30°W and from 42°S–51°28′S in the Argentine Basin, in hauls with 1000–4000 m of cable out. The length range for males was 2.80–3.05 mm and for females 3.05–3.35 mm. The antarctic form is larger than the arctic form for which Skogsberg (1920) gave measurements of 2.1–2.3 mm for males and 2.4–2.9 mm for females. The female has more sharp-edged shoulder vaults (Fig. 9a, b) than the male (Fig. 9c, h). The male appears to differ from male *C. borealis* Sars, as figured by Skogsberg (1920, Fig. 135-4), in having fewer teeth on the principal seta (Fig. 9e); 40–45 pairs of teeth were noted, whereas Skogsberg described 50–55 pairs of teeth on the principal seta of males from Lofoten. The clasping organs and frontal organ (Fig. 9d, f, g) are similar to those of the arctic form.

Distribution: 1°S–65°S in the Atlantic and Antarctic Oceans.

Imbricata Group Müller

C. imbricata (Brady). This species was recorded at 18°S, 24°S and from 27°30′S–40°S, and was not found south of the subtropical convergence.

Distribution: 63°N–55°S in the Atlantic; Pacific and Indian Oceans.

C. ametra Müller. *C. ametra* was taken from 30°S–40°S, 30°W and from 42°S–44°S in the Argentine Basin, in hauls with 1100–4000 m of cable out. A length range of 3.75–4.10 mm was noted for males and of 4.5–4.8 mm for females.

Distribution: 60°N–37°S in the Atlantic; Indian and Pacific Oceans. These specimens extend the range south to 44°S.

C. plinthina Müller. A single juvenile specimen, 4.1 mm long, was found at 42°30′S in a haul with 2500 m of cable out. This is the largest species of this group.

Distribution: 48°N–31°S in the Atlantic; Indian and Pacific Oceans. This specimen extends the range to 42°30′S.

C. symmetrica Müller. *C. symmetrica* occurred from 35°S–55°S, 30°W and from 42°S–47°S in the Argentine Basin, in hauls with 1000–4000 m of cable out. The length range for females was 4.1–4.5 mm and for males 3.7–4.0 mm.

Distribution: 0–55°S in the Atlantic; Indian Ocean and Pacific Antarctic.

Alata Group Müller

C. hettacra Müller. *C. hettacra* (Fig. 9i–k) occurred from 49°S–55°S, 30°W and from 42°S–51°30′S in the Argentine Basin, at shallow depths, since it was taken in the 200 and 100 m tows. The length range for females was 2.25–2.45 mm and for males 1.80–1.95 mm.

Distribution: 47°S–57°S in the Atlantic, so these specimens extend the range north to 42°S; 43°S–70°S in the Indian Ocean.

C. valdiviae Müller. This species occurred from 32°30′S–42°30′S,

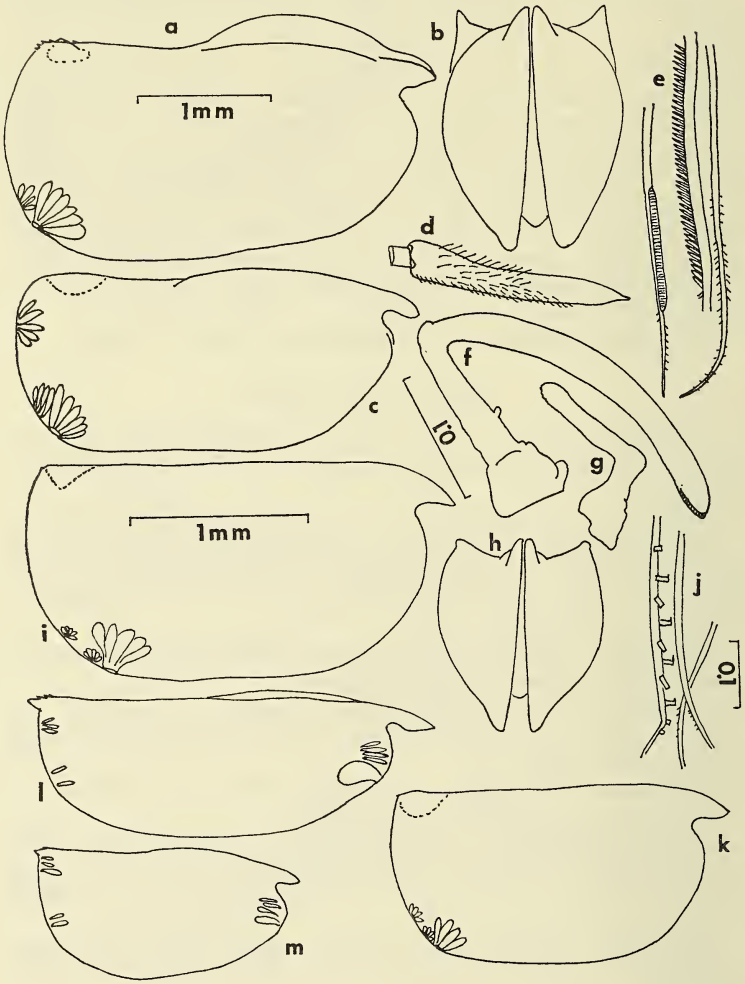

Fig. 9. a and b, Lateral and posterior views of female *Conchoecia borealis antipoda*; c, Lateral view of male; d, Capitulum of male frontal organ; e, Armature of male first antenna; f and g, Right and left male claspers; h, Posterior view of male; i, Lateral view of female *C. hettacra*; j, Armature of *C. hettacra* male first antenna; k, Lateral view of male; l and m, Lateral views of female and male *C. chuni*. Scale on a for a–c and h, beside f for f and g, on lower right margin for d, e, and j, on i for i, k–m. Scales in mm.

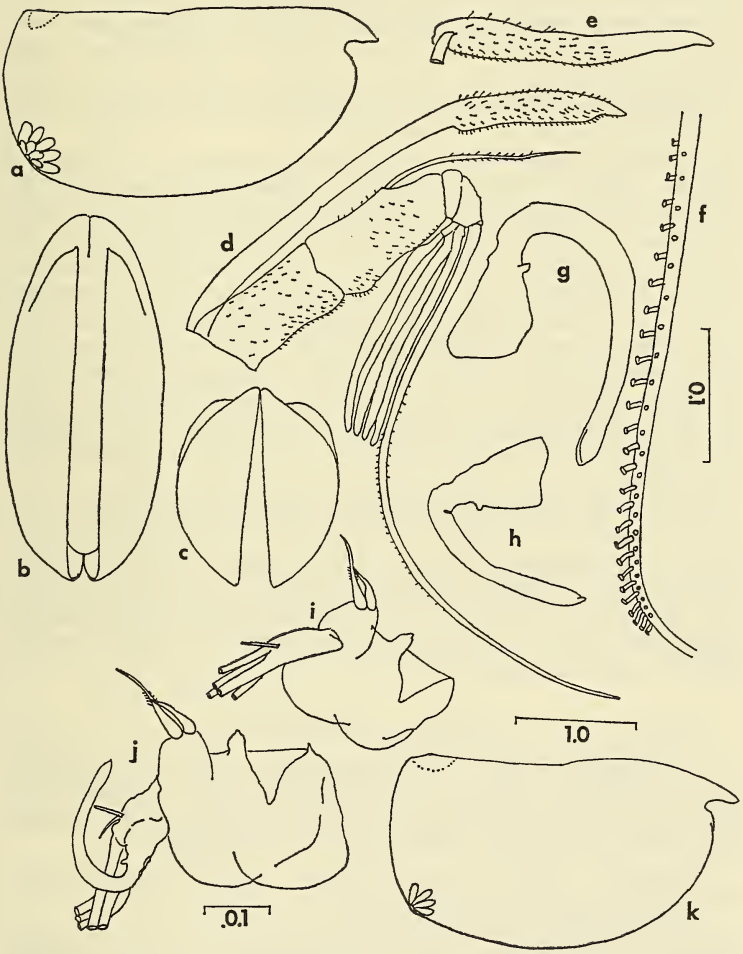

Fig. 10. *Conchoecia belgicae.* a, b and c, Lateral, ventral and posterior views of female; d, Female frontal organ and first antenna; e, Capitulum of male frontal organ; f, Armature of principal seta of male first antenna; g and h, Right and left male claspers; i, Endopodite of female second antenna; j, Endopodite of male right second antenna; k, Lateral view of male. Scale above k for a–c and k, at bottom for d, e, i, j, on right margin for f–h. Scales in mm.

30°W and from 42°S–45°S in the Argentine Basin. *C. valdiviae* is exceptionally large and bulky, deep red in color when alive. Most specimens were immature, but one female was 5.35 mm long and one male 5.0 mm in length.

Distribution: 28°N in the Gulf of Mexico (Kornicker, 1968) to 47°S in the Atlantic; to 58°S in the Indian Ocean.

C. belgicae Müller (Figure 10). One 2.8 mm male was obtained at 51°30′S, 40°W, in a haul with 600 m of cable out, and one female 2.9 mm long was taken at 55°S in a haul with 1100 m of cable out. These specimens agree with Müller's (1906b) and Skogsberg's (1920) descriptions and figures. Müller's "Belgica" females were 2.4–2.7 mm long and his males 2.4–2.6 mm long, but speciemns from the Gausstation (66°2.9′S, 89°38′E) were larger: females 2.6–3.0 mm long and males 2.6–2.8 mm in length. Figure 10 illustrates the shape of the male and female shells and the structure of the first and second antennae. According to Skogsberg, the male first antenna has 27–30 pairs of teeth, similar in shape to those of the *C. hettacra* male (Fig. 9j). The HUDSON 70 specimen had 26 teeth in lateral view, the two rows unevenly paired (Fig. 10f).

Distribution: Müller described this species from 70°S–71°S in the Pacific Antarctic, and obtained it later from 65°S–66°S in the Indian Antarctic. Skogsberg's specimens were from about 66°S in the Atlantic. Barney (1921) reported it abundant at a number of stations in the Ross Sea and McMurdo Sound and also at two stations north of New Zealand. The HUDSON 70 specimens extend the range in the Atlantic north to 51°30′S.

Daphnoides Group Müller

C. daphnoides (Claus). *C. daphnoides* was recorded from about 5°S and 23°S to 40°S, 30°W, and at 42°S in the Argentine Basin, and therefore was not found south of the subtropical convergence. Males ranged in length from 2.8–3.1 mm and females from 4.8–5.6 mm.

Distribution: 60°N–37°S in the Atlantic; Indian and Pacific Oceans. These specimens extend the range to 42°S.

C. chuni Müller. *C. chuni* (Fig. 9l, m) was taken from 32°30′S–55°S, 30°W, and from 42°S–50°S in the Argentine Basin, in shallow as well as deeper hauls. The length range for males was 1.40–1.55 mm and for females 2.0–2.4 mm.

Distribution: 26°S–53°S in the Atlantic; 2°S–44°S in the Indian Ocean, and to 64°S in the Pacific. These specimens extend the range slightly to 55°S.

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